

Cooling Water Systems for Accelerator Components at the Advanced Photon Source*

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Abstract

As in most accelerators at the Advanced Photon Source, water is the media of choice for absorbing heat generated by a multitude of accelerator components. APS has a large cooling water distribution system with flow rate of nearly 10,000 gpm in the primary circuit and small closed-loop water systems with flow rates of less than 100 gpm installed. The central plant houses primary water distribution pumps, heat rejection equipment, and polishing and make-up systems. All water used for heat rejection by accelerator equipment is deionized and filtered to provide a minimum resistivity of 3 mega ohm-cm and a maximum particle size of 0.5 microns. Water temperature and pressure are controlled at 35 secondary systems before the water is delivered to the accelerator components. The temperature of various water systems is controlled to as tight as ∇ 0.1 deg F. With most accelerator components interlocked on water flow and temperature, it is imperative that both are maintained with a high degree of reliability. It is also necessary for water systems to be designed with sufficient flexibility to allow for easy modifications, additions, and expansions. Since the original water systems were installed, a number of system upgrades have been completed to improve reliability and to integrate new operating parameters. Additional improvements are being planned. Lessons learned will be discussed.

Keywords: deionized, cooling, process water

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